CLAIMS

We claim:

1. A method for maximizing light transmission through an optical switch which includes a first mirror to direct a beam of light received from an input optical port to a second mirror that redirects the beam of light to an output optical port, the first and second mirrors each being pivotally actuated on first and second axes, the method comprising:

(a) simultaneously moving the input and output mirrors through a sequence of coordinate positions about an origin;

(b) reading a light intensity value transmitted to the output optical port at each coordinate position;

(c) comparing the light intensity value read at each coordinate position with a previous light intensity value, if a particular coordinate position produces a light intensity value greater than the previous light intensity value, then

(d) shifting the origin to the particular coordinate position.

2. The method of claim 1 wherein the previous light intensity value is read at the origin.

3. The method according to claim 2 further comprising:

(e) repeating (a) – (d).

4. The method of claim 3 wherein a maximum light intensity is found when none of the light intensity values produced at the coordinate positions in the sequence is greater than the previous light intensity value read at the shifted origin.

5. The method of claim 1 wherein the sequence is calculated in accordance with a set of mathematical equations.

6. The method of claim 5 wherein the set of mathematical equations comprises:

x = radius * sin (theta) * cos (phi) + originx;
y = radius * sin (theta) * sin (phi) + originy;
z = radius * cos (theta) + originz;
x4 = -((cos (tx4) - sin (tx4)) * radius) + originx4

where x, y, z, and x4 denote a four-dimensional coordinate position, theta is an angle, originx, originy, originz, and originx4 denote a position of the origin, and radius is a distance from the origin.

7. The method of claim 6 wherein the distance from the origin corresponds to a current applied to actuators that pivot the input and output mirrors.

8. A method for maximizing light transmission through an optical switch which includes first and second mirrors, each mirror being pivotally actuated on first and second axes, the method comprising:

(a) moving the input and output mirrors to a predetermined origin;

(b) reading a first light intensity value at an output port of the optical switch with the input and output mirrors at the predetermined origin;

(c) calculating new coordinate positions for the input and output mirrors based on a set of mathematical equations;

(d) simultaneously moving the input and output mirrors to the new coordinate positions;

(e) reading a current light intensity value at an output port of the optical switch with the input and output mirrors at the new coordinate positions;

(f) comparing the current light intensity value against the first light intensity value, if the current light intensity value is greater than the first light intensity value, then

(g) shifting the predetermined origin to the new coordinate positions.

9. The method of claim 8 further comprising:

(h) storing the current light intensity value as the first light intensity value for the shifted origin; and

(i) repeating (c) - (h).

10. The method of claim 8 further comprising repeating (c) - (g) when the current light intensity value is less than or equal to the first light intensity value.

11. The method of claim 8 wherein the set of mathematical equations comprises:

x = radius * sin (theta) * cos (phi) + originx;
y = radius * sin (theta) * sin (phi) + originy;
z = radius * cos (theta) + originz;
x4 = -((cos (tx4) - sin (tx4)) * radius) + originx4

where x, y, z, and x4 denote a four-dimensional coordinate position, theta is an angle, originx, originy, originz, and originx4 denote a position of the predetermined origin, and radius is a distance from the predetermined origin.

12. A computer program product comprising:

a computer useable medium and computer readable code embodied on the computer useable medium for causing actuation of input and output mirrors of an

optical switch so as to maximize light transmission through the optical switch, execution of the computer readable code causing:

simultaneous movement of the input and output mirrors through a sequence of coordinate positions about an origin, the input and output mirrors pivotally moving on first and second axes;

a light intensity value to be read at an output optical port for each coordinate position;

comparison of the light intensity value read at each coordinate position with a previous light intensity value, if a particular coordinate position produces a light intensity value greater than the previous light intensity value, then the computer readable code causing the origin to be shifted to the particular coordinate position.

13. The computer program product of claim 12 wherein the previous light intensity value is read at the origin.

14. The computer program product of claim 12 wherein the sequence is calculated in accordance with a set of mathematical equations.

15. The computer program product of claim 12 wherein the set of mathematical equations comprises:

$$x = radius * \sin(theta) * \cos(phi) + originx;$$
$$y = radius * \sin(theta) * \sin(phi) + originy;$$
$$z = radius * \cos(theta) + originz;$$
$$x4 = -((\cos(tx4) - \sin(tx4)) * radius) + originx4$$

where x, y, z, and x4 denote a four-dimensional coordinate position, theta is *an angle, originx, originy, originz, and originx4 denote a position of the origin, and* radius is a distance from the origin.

16. A method of maintaining maximum light transmission through an optical switch which includes first and second mirrors, each mirror being pivotally actuated on first and second axes, the method comprising:

(a) incrementally stepping the first mirror through a series of coordinate positions along the first axis;

(b) reading a light intensity value transmitted to an output optical port at each coordinate position;

(c) comparing the light intensity value read at each coordinate position with a previous light intensity value, if a particular coordinate position produces a light intensity value greater than the previous light intensity value, then

(d) shifting the origin to the particular coordinate position.

17. The method of claim 16 further comprising: repeating (a) - (d) for the first mirror along the second axis.

18. The method of claim 16 further comprising: repeating (a) - (d) for the second mirror.

19. The method of claim 16 further comprising: repeating (a) - (d) for the second mirror along the second axis.

20. A method of maintaining maximum light transmission through an optical switch which includes first and second mirrors, each mirror being pivotally actuated on first and second linear axes, the method comprising:

(a) continually measuring a light intensity value at an output optical port of the optical switch;

(b) moving the first mirror along the first linear axis, and then along the second linear axis;

(c) moving the second mirror along the first linear axis, and then along the second linear axis;

(d) shifting an origin of the first and second mirrors whenever the light intensity value measured at a particular coordinate position is greater than a current maximum light intensity value, the origin being shifted to the particular coordinate position.

21. The method of claim 20 further comprising:

(e) storing the light intensity measured at the particular coordinate position as the current maximum light intensity value;

(f) repeating (a) - (e).